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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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OCT 14 2005
PATENT & TRADEMARK OFFICE

In re Application of: **BOZIDAR JANKO, KEVIN M. FERGUSON, GALE L. STRANEY and GEORGE M. WILLIAMS**

Filed: **April 17, 2001**

Examiner: **Frank Duong**

Serial No.: **09/836,969**

Art Unit: **2666**

For: **STREAMING MEDIA QUALITY ANALYZER SYSTEM**

October 12, 2005

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APPEAL BRIEF

Dear Sir:

This is an appeal from the Examiner's decision dated June 10, 2005 finally rejecting claims 1-15 over prior art.

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Real Party in Interest

The real party in interest is Appellants' assignee, Tektronix, Inc., an Oregon corporation.

Related Appeals and Interferences

There are no prior or pending appeals, interferences or judicial proceedings known to Appellants or Appellants' legal representative or assignee which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

Status of Claims

Claims 1-15, the only claims in the case, stand finally rejected and are the claims being appealed.

Status of Amendments

No amendments to the claims were filed subsequent to the final rejection by the Examiner.

Summary of Claimed Subject Matter

The present invention is a streaming media quality analyzer system for measuring the quality of reception at remote places. (Page 1, lines 6-7) Referring to Fig. 1 and claim 1, packetized streaming media is transmitted from a source **12-16** over a network **18** to a remote site **20-26**. The packetized streaming media received at the remote site is analyzed **(32)**, and the results of the analysis are transmitted over the network **34** to a measurement site **28, 30, 36**. At the measurement site the results of the analysis are used to reconstruct **(30)** the packetized streaming media received at the remote site. The reconstructed packetized streaming media is analyzed **(28, 36)** to determine the quality of the packetized streaming media received at the remote site. (Page 3, line 11 - page 5, line 20) The analysis results from the remote site contains information that has just a few numbers, such as time of arrival and packet sequence number, which information is encoded as signal data packets in a connected transport layer, such as TCP/IP or RTP/RTCP, and transmitted over a signal link **34** portion of the network to the measurement site. (Page 4, line 9 - page 5, line 3)

Grounds of Rejection to be Reviewed on Appeal

Claims 1-15 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu et al (USP 5,768,527 – "Zhu") in view of Wolf et al (USP 5,446,492 – "Wolf").

Argument

35 U.S.C. 103(a) provides in pertinent part that "[A] patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." The U.S. Supreme Court has established that this means ascertaining the scope and content of the prior art, the differences between the prior art and the claims, and the level of ordinary skill in the pertinent art. *Graham v. John Deere Co. of Kansas City*, 148 USPQ 459, 467. It is axiomatic that in order to combine references there must be some teaching or suggestion in the references to do so. *In re Gruskin*, 110 USPQ 288, 292.

Discussion of References:

(a) Zhu discloses a device, system and method for real-time streaming of a multimedia file stored in a remote server over a packet network to a multimedia client connected to the same network via a low-speed access link, such as an analog telephone line, which device, system and method provides significantly improved QoS with respect to both quality and delay. (Abstract) Fig. 5 shows a multimedia bitstream that is rate scaled(508), packetized (510), buffered (512) and transmitted (514) over a packet network 504 from a server 502 to a client 506. At the client the packetized stream is buffered (302), processed (304) and played by a multimedia player 308. Coupled to the packet

processor 304 is a QoS manager 306 that includes an end-to-end packet loss rate estimator 310, a QoS optimizer 312, a feedback message generator 314 and a retransmission manager 316. The feedback message generator 314 provides a control message back to the server 502 where it is processed by a feedback message processor 516. The control message is either a retransmission message, in which case the feedback message processor 516 accesses the packet transmitter 514 to retransmit the requested packet from the packet buffer 512, or a rate control message, in which case the feedback message processor accesses the rate scaler 508 to change the bit rate of the multimedia bit stream prior to packetizing (510). It is noted that the server is controlled by the client in order to achieve the best possible quality for the multimedia player with the minimum of delay.

(b) Wolf discloses a perception-based video quality measurement system for objectively measuring the image quality of an analog destination video signal. Fig. 2 shows a system where an analog source video signal 1 is transmitted via a transmission channel 3 to become the analog destination video signal 5. The source video signal is processed by a source instrument 6 to determine spatial and temporal statistics (18-24). Likewise the destination video signal is processed by a destination instrument 12 to determine similar spatial and temporal statistics (26-32). The statistics are transmitted over a communication circuit 11 (Fig. 1) to quality and time alignment processors 34, 35 which may be in either of the source/destination instruments. From the statistics the quality processor computes a set of quality parameters and a quality score parameter. The

quality analysis determines an optimal combination of the source and destination statistics so that the quality parameters and quality score parameter correlate well with subjective viewing panel results.

Claims 1, 9, 10 and 11

Both Zhu and Wolf teach sending a signal from a source to a destination via a transmission channel – Zhu in digitized packetized form and Wolf in analog signal form. Both references also teach analyzing at the destination the respective received packets/signal to generate information. In the case of Zhu the information is control information for retransmitting packets or rescaling the bit rate of the source bit stream. In the case of Wolf the information is spatial/temporal statistics or features of the destination analog signal. Wolf teaches actually measuring for quality of service by comparing the measured spatial/temporal statistics for the analog destination signal with comparable measured spatial/temporal statistics for the analog source signal. Appellants submit that neither reference teaches or suggests that the packetized streaming media, as received at the remote/destination site, is reconstructed at the measurement site based upon the results of the analysis at the remote/destination site, which reconstructed packetized streaming media is then analyzed for quality of service.

The Examiner states that Zhu teaches transmitting packetized streaming media from a source over a network to a remote site, and relies upon feedback from the remote site to retransmit lost packets as a way of improving quality of service, but does not teach

measuring video quality based on the feedback or analysis from the remote site. The Examiner then states that Wolf provides the means for reconstructing the packetized streaming media at the remote site from the feedback or analysis provided from the remote site, and analyzing such reconstructed packetized streaming media to provide a measurement of quality of service. In response to Appellants' arguments the Examiner insists that Wolf discloses analyzing reconstructed packetized streaming media that represents the packetized streaming media received at the remote site, referring to column 5, lines 26-30 and column 6, lines 17-25.

Wolf recites that "[T]he source features 7 and destination features 9 are used by the quality processor 35 to compute a set of quality parameters 13 (p1, p2, . . .), and quality score parameter 14(q)."; and that "[T]he quality analysis means 43 determines the optimal combination of the source features 7 and the destination features 9 so that the quality parameters 13 and the quality score parameter 14 are produced which correlate well with the viewing panel results 40. Preferably, in the method of the present invention, the output of the quality analysis means 43 determines the internal functioning of the quality processor 35." Appellants fail to see any language in Wolf or Zhu that teaches or suggests to one of ordinary skill in the art that a received packetized streaming media or analog signal is reconstructed at the measurement site (quality processor of Wolf or feedback message processor of Zhu) based upon the feedback or measurements received from the remote site. Wolf at best corresponds to Appellants' quality analyzer 28 where impaired analog video/audio (destination video signal) – decoded from the reconstructed packetized streaming media -- is compared with the original analog video/audio (source video signal)

to produce a quality measurement. There is nothing comparable in either Zhu or Wolf to Appellants' receiver emulator 30 that reconstructs the packetized streaming media that is received at the remote site using the information fed back from the remote site. The Examiner has consistently ignored this "reconstructing" means or step as recited in claims 1, 9, 10 and 11 (receiver emulator). The quality/time alignment processors of Wolf do not teach or suggest that the received signal is recreated based upon the measured results at the destination because it is not the analog signals that are compared in Wolf, but rather features extracted from the respective analog signals that are processed to produce the quality score.

Therefore Appellants submit that any reasonable combination of Zhu and Wolf by one of ordinary skill in the art does not produce Appellants' claimed invention as neither reference teaches or suggests that the packetized streaming media as received at the remote site is reconstructed at the measurement site using the information obtained at the remote site from such received packetized streaming media. The only way one of ordinary skill in the art could produce a combination that is equivalent to Appellants' claimed invention would be to use impermissible hindsight and use the teachings of Appellants to bridge the gap missing from Zhu and Wolf of reconstructing at the measurement site the packetized streaming media as received at the remote site from the information generated at the remote site.

Conclusion

Thus Applicants request that the Examiner's rejection of claims 1-15 be reversed as not being obvious to one of ordinary skill in the art from Zhou in view of Wolf, and that this case be passed to issue.

Respectfully submitted,

BOZIDAR JANKO et al

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Claims Appendix

1. A streaming media quality analyzer system comprising:

means for transmitting packetized streaming media from a source over a network to a remote site;

means for performing an analysis of the packetized streaming media received at the remote site;

means for transmitting results of the analysis over the network to a measurement site;

means for reconstructing at the measurement site using the results of the analysis the packetized streaming media received at the remote site; and

means for analyzing the reconstructed packetized streaming media at the measurement site to determine the quality of the packetized streaming media received at the remote site.

2. The streaming media quality analyzer system as recited in claim 1 wherein the packetized streaming media transmitting means comprises means for packetizing the streaming media into user datagram protocol packets as the packetized streaming media.

3. The streaming media quality analyzer system as recited in claim 2 wherein the results transmitting means comprises means for packetizing the results into transmission control protocol packets.

4. The streaming media quality analyzer system as recited in claim 3 wherein the analyzing means comprises:

first means for decoding the reconstructed packetized streaming media to recover an impaired streaming media; and

means for determining from the impaired streaming media the quality of the packetized streaming media received at the remote site.

5. The streaming media quality analyzer system as recited in claim 4 wherein the determining means comprises a media quality analyzer having a reference input coupled to receive the streaming media from the source and a test input coupled to receive the impaired streaming media and providing as an output a measure of the quality of the packetized streaming media received at the remote site.

6. The streaming media quality analyzer system as recited in claim 4 wherein the determining means comprises:

second means for decoding the packetized streaming media from the source to recover the streaming media; and

a media quality analyzer having a reference input coupled to receive the streaming media from the second decoding means and a test input coupled to receive the impaired streaming media and providing as an output a measure of the quality of the packetized streaming media received at the remote site.

7. The streaming media quality analyzer system as recited in claim 3 wherein the analyzing means comprises:

means for recovering the packetized streaming media from the network as originally transmitted by the source, the recovered packetized streaming media being input as the packetized streaming media to the reconstructing means;

means for decoding the recovered packetized streaming media and the reconstructed packetized streaming media to produce a reference streaming media and an impaired streaming media respectively; and

means for determining from the reference streaming media and the impaired streaming media a measure of the quality of the packetized streaming media received at the remote site.

8. The streaming media quality analyzer system as recited in claim 2 wherein the results transmitting means comprises means for packetizing the results into realtime transport control protocol packets where realtime transport protocol is used as an application layer over user datagram protocol packets.

9. A method of quality analyzing at a measurement site a streaming media that is packetized and transmitted over a network from a source to a remote site comprising the steps of:

performing an analysis of the packetized streaming media received at the remote site;

transmitting results of the analysis over the network to the measurement;

reconstructing at the measurement site from the packetized streaming media that was transmitted and the results of the analysis the packetized streaming media received at the remote site; and

analyzing at the measurement site the reconstructed packetized streaming media to determine the quality of the packetized streaming media received at the remote site.

10. A streaming media quality analyzer system for a streaming media transmission system of the type that transmits streaming media from a source over a network packetized streaming media to a remote site for display comprising:

means at the remote site for performing an analysis of the packetized streaming media;

means for transmitting results of the analysis over the network to a measurement site;

means at the measurement site for reconstructing from the packetized streaming media from the source and the results from the remote site the packetized streaming media as received at the remote site; and

means for analyzing the reconstructed packetized streaming media at the measurement site to determine the quality of the packetized streaming media received at the remote site.

11. A streaming media quality analyzer system for a streaming media system having

streaming media transmitted from a source as packetized streaming media over a network to a remote site for use comprising:

a reference server located at the remote site having as an input the packetized streaming media as received at the remote site and having as an output an analysis of the packetized streaming media;

means for transmitting the analysis over the network to a measurement site;

a receiver emulator having as inputs the packetized streaming media and the analysis and having as an output a reconstructed packetized streaming media that resembles the packetized streaming media received at the remote site; and

means for analyzing the reconstructed packetized streaming media to determine the quality of the packetized streaming media received at the remote site.

12. The streaming media quality analyzer system as recited in claim 11 wherein the analyzing means comprises:

means for decoding the reconstructed packetized streaming media to produce an impaired streaming media; and

a media quality analyzer having the impaired streaming media as an input which determines the quality of the packetized streaming media received at the remote site.

13. The streaming media quality analyzer as recited in claim 12 wherein the media quality analyzer has a reference input to which the streaming media from the source is applied and a test input to which the impaired streaming media is applied, and has an output

providing a measure of the quality of the packetized streaming media received at the remote site.

14. The streaming media quality analyzer as recited in claim 13 wherein the analyzing means further comprises a second means for decoding original data packets representing the streaming media in the packetized streaming media to recover the streaming media from the source for input to the media quality analyzer.

15. The streaming media quality analyzer as recited in claim 14 wherein the analyzing means further comprises means at the measurement site for recovering the packetized streaming media from the network resembling the packetized streaming media prior to transmission over the network, the recovered packetized streaming media being input to the second decoding means to recover the streaming media from the source.